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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Gunzel et al.	) Group Art Unit: 1794
	) Examiner: Elizabeth M. Cole
Serial No.: 10/699,109	) Conf. No.: 1873
	)
Filed: October 31, 2003	)
	)
For: Attachment of Cables to Flexible Fabric	)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR §1.131

I, Edward Gunzel hereby declare that:

1. I am an inventor of subject matter disclosed and claimed in the above identified patent application. I have been employed by W. L. Gore and Associates, Inc. since 1993, where among other things, I have worked on new product research and development for the Fabrics Division for about 14 years.

2. I have a BS in Materials Science and Engineering from Lehigh University and a MS in Physics from the University of Delaware, and experience in lamination, polymers, and polymeric membranes.

3. I have reviewed the Office Action of July 3, 2008 concerning application 10/699,109. I have also reviewed the cited art of US Patent Application Publication 2001/ 006173 (Rock et al., hereinafter '6173), US Patent No. 3,768,156 (Caird), US Patent No. 5,236,765 B1 (Cordia), and US Patent No. 5,658,164 B1 (Parker).

4. I have prepared fabric samples using two different types of conductive yarns (S11034Y and S4412Y, Marktek Inc.) and conductive cable (MSTC32, W. L. Gore & Associates, Inc.) as outlined in Appendix A.

5. Samples were prepared wherein the yarns and cables were secured to fabric by lamination and covered by a barrier using lamination as suggested by U.S. Pub. '6173.

6. Other samples were prepared wherein the yarns and cables were secured to the fabric by taping methods in the teachings of Applicants' instant application 10/699,109.

7. All samples were washed substantially according to the test method for Conductivity After Continuous Wet Flex And Abrasion disclosed in Applicants' pending patent application, 10/699,109 at page 16 of the application as originally filed.

8. The samples were visually inspected for delamination after wash cycles. Samples were tested for conductivity after wash cycles and were compared with initial pre-wash conductivity measurements.

9. Table 1 summarizes data of delamination after wet flex (wash) for sample fabrics having conductive cables (MSTC32) secured by either lamination of a barrier layer of narrow width (5cm) and sample fabrics wherein the conductive cable is secured by taping. The sample fabrics (Sample 1) wherein the conductive cables were secured by lamination of a narrow barrier layer delaminated significantly after two hours. The sample fabrics (Sample 2) wherein the conductive cable was secured by tape remained intact after 5 hours of testing.

10. Table 2 summarizes data for wet flex performance of sample fabrics made with eight strands of conductive yarns (S11034Y) twisted together and secured by laminating either wide (25cm) barrier material or narrow (5cm) barrier material, and samples secured by taping. The test was run until samples exceeded 100 ohms per sample, or until at least about 10 hours if the sample remained under 100 ohms. The sample fabrics laminated by a wide barrier material (Sample 3) exceeded ohms at an average of about 3.25 hours. The sample fabrics laminated by a narrow barrier material (Sample 4) exceeded 100 ohms at about 3 hours. The sample fabrics secured by tape (Sample 5) remained under 100 ohms after 10 hours of testing.

11. Table 3 summarizes data for wet flex performance of samples made with three strands of conductive yarns (4121Y) twisted together and secured laminating wide barrier material and sample fabrics secured by tape. The conductive yarns provided samples having an initial resistance of greater than 100 ohms per sample, so the samples were tested until the performance deteriorated to 1000 ohms. The sample fabrics (Sample 6) laminated by a wide barrier exceeded 1000 ohms after about 1.7 hours.

The taped sample fabrics (Sample 7) exceeded 1000 ohms after about 3 hours.

12. I conclude that sample fabrics of all conductive yarns and cables tested showed significant decrease in performance when laminated with a wide barrier material compared to the taped samples, when measured for deterioration of resistance and/or delamination.

13. I assert that the samples prepared according to Applicants' instant specification are not apparent from the teachings of the art cited against the currently pending claims.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of inventor: Edward Gunzel

Inventor's signature Edward Gunzel

Date: 12/5/08 Country of Citizenship U.S.A.

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Appendix A

Fabric panels for all samples were constructed of a two layer Gore-Tex laminate comprising a membrane layer and a 2.0 oz/yd^2 woven nylon textile (BD350P, W. L. Gore & Associates, Inc.). Sections of the laminate material measuring approximately 14 inch x 14inch (36 cm X 36 cm) were sewn together to form fabric panels of 28 inch x 14 inch (72 cm x 36 cm), using a flat feld seam with a seam allowance of 6 mm. These panels were then individually placed on a padded platen.

After sewing multiple fabric panels, sample fabrics were prepared with conductive cables and two different types of conductive yarns.

I. Sample Fabrics with Conductive Yarn

Multiple strands of the conductive yarns (S4412Y and S11034Y) were cut to 16 inch (41 cm) length (from Marktek, Inc. Chesterfield, MO) and then twisted together to achieve a targeted level of conductivity (less than 100 ohms per sample and greater than 100 ohms per sample). The twisted conductive yarns were subsequently laid on the textile side of the fabric panels, spanning across the seam. Multiple samples were prepared.

The conductive yarns were then secured to the fabric panels by lamination or by taping. All samples were secured in place using a heated press set to 360°F (182°C) and a pressure of 30 psi for about 15 seconds dwell time. The samples were allowed to cool before handling, initial resistance measurements, and subsequent exposure to continuous wash.

Laminated sample fabrics were made using a polyamide adhesive web (PA1001-100-060T from Spunfab, Inc. Cuyahoga Falls, OH) and a second layer of the two layer BD350P Gore-Tex laminate (W. L. Gore & Associates, Inc.), with the adhesive web disposed between the panel with conductive yarn and the second layer of BD350P prior to laminating in the hot press. Taped sample fabrics were made using a two layer 2.2 cm wide tape having 0.1 mm thick adhesive, similar to that described in Examples 2-6 of the current specification.

Samples prepared using S11034Y conductive yarns had an initial measurement of less than 100 ohms per sample. Samples prepared using S4412Y conductive yarns had an initial measurement of greater than 100 ohms per sample.

Samples were tested for Wet Flex and Abrasion. Results are reported in Tables 2 and 3 (Appendix A).

II. Sample Fabrics with Conductive Cable

A flat ribbon cable (MSTC32) having about 32 fine gauge parallel conductors was cut to 19 inch (41cm) length and secured to the fabric panels by lamination or by taping and prepared substantially as described above for Sample Fabrics with Conductive Yarns. Samples were tested for Wet Flex and Abrasion. Results are reported in Table 1.

Appendix B

Table 1 - Wet Flex Performance to Delamination of MSTC32 Conductive Cables

All samples used MSTC32 conductive cable with a flat feld seam

Sample ID	Attachment Means	Performance
1 *	Laminate	Significant Delamination at 2 hours
2 *	Seam Tape	No Delamination at 5 hours

* Data represents an average of 4 samples

Table 2 - Wet Flex Performance for Conductive Yarns (S11034Y) with samples having initial resistance of less than 100 ohm/meter

All samples used S11034Y conductive yarns.

Sample ID	Attachment Means	R initial (sample, ohms)	R initial (ohms per meter)	Wash hours before resistance exceeded 100 ohms
3 *	Laminate Sheet (25cm wide)	25	63	3.25
4 **	Laminate Strip (5 cm wide)	28	70	3
5 *	Seam Tape (2.2 cm wide, 4 mil thick adhesive)	35	90	>10

* Data represents an average of four samples
** Data represents an average of two samples

Table 3 - Wet Flex Performance for Conductive Yarns (S4412Y) with samples having initial resistance of greater than 100 ohm/meter

All samples used S4412Y conductive yarns.

Sample ID	Attachment Means	R initial (sample, ohms)	R initial (ohms per meter)	Wash hours before resistance exceeded 1000 ohms
6 *	Laminate Sheet (25 cm wide)	108	270	1.7
7 *	Seam Tape (2.2 cm wide, 4 mil thick adhesive)	123	308	3

* Data represents an average of three samples
** Data represents an average of two samples